

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

Claims 1-14, 17-25 and 29 remain in the application. Claims 30-33 have been withdrawn from consideration. Claims 1 and 17 have been amended to clarify the operation of a single controllable segment of the display to passively transmit non-human readable status and parking-related data from the parking apparatus by modulating on and off the light reflected by the corner cube or reflector positioned behind the single controllable segment. Support for these claim amendments can be found on page 9, line 2-line 20; page 25, line 3- page 26, line 8.

Claims 1 and 17 have been amended to clarify that the data is being passively transmitted as light being reflected from the corner cube or reflector disposed behind a single controllable segment of the display, wherein the display include a plurality of segments. The single controllable segment of the display is turned on and off at a serial data rate to modulate the light reflected by the corner cube or reflector to transmit non-human readable data to a device external to the meter. It is respectfully submitted the amended claims 1 and 17 are supported by the original specification at page 25, lines 3-18 which reads:

Besides the IRSI 18, the in-car parking meter has the ability to communicate with an external receiver, for example, a data collector portably carried by a parking enforcement official, through the use of a passive transmitter, i. e., a corner cube. The corner cube will allow the in-car parking meter to transmit serial data optically and passively. The corner cube will be positioned behind a controllable segment of the LCD display 34. When the segment is on (opaque), the optical path from the corner cube to the external receiver is blocked. When the segment is off (transparent), the optical path is clear. The key to employing an optical corner cube is

the fact that the corner cube has the property of reflecting any light striking it from a point source directly back to the point source, i. e., an external receiver. The external receiver comprises a photodetector, along with the point source, which is able to detect any light being reflected back by the corner cube. To passively transmit serial data, the segment of the display only needs to be modulated on and off at the serial data rate and the external receiver provides the transmission medium of light emanating from the point source. (Emphasis added)

Therefore, it is respectfully submitted no new matter has been added by these claim amendments.

Claims 1-2 and 13 were rejected under 35 USC 103(a) as being unpatentable by Huang (US Patent 4,847,776) in view of Ferguson (US Patent 6,184,969) as set forth on pages 2-5 of the office action. Claims 3-12 and 14 were rejected under 35 USC 103(a) as being unpatentable over Huang (US Patent 4,847,776) in view of Ferguson (US Patent 6,184,969) in further view of Jacobs (US Patent 6,195,015 B1) as set forth on pages 5-8. Claims 17-25 and 29 were rejected under 35 USC 103(a) as being unpatentable over Huang (US Patent 4,847,776) in view of Ferguson (US Patent 6,184,969) in further view of Jacobs (US Patent 6,195,015 B1) as set forth on pages 8-14.

Claim 1 is directed to an electronic apparatus for use in a parking system including, inter alia, "a housing; a microcomputer disposed within said housing, said microcomputer further comprising at least one memory for storing parking parameters and credits; a time monitoring crystal electrically coupled to said microcomputer to generate accurate timekeeping, wherein the microcomputer debits the stored credits based on the stored parking parameters and time; a display means for displaying human readable information including a plurality of segments electrically coupled to and controlled by said microcomputer, said display means externally located on a face of said housing, wherein

each segment is configured to allow light to pass through said display means when each segment is off and blocks light from passing through said display means when each segment is on; a corner cube disposed behind a single segment of the plurality of segments of said display means configured to reflect light back to a source external of the apparatus when the single segment is off, wherein upon light being directed at said display means by the source external to the apparatus, the **single segment** is turned on and off at a serial data rate by said microcomputer to passively transmit non-human readable status and parking-related data from said apparatus by modulating on and off the light reflected by the corner cube through the single segment; at least one momentary switch for operating said apparatus; and a battery to power to said apparatus” (Emphasis added).

The apparatus of amended claim 1 passively transmits data as light being reflected from the corner cube disposed behind a single segment of the display. When light from an external source is directed at the display (and thus the single segment), the controllable single segment of the display is turned on and off at a serial data rate to modulate the light reflected by the corner cube (see page 25, lines 3-17 of the instant application). In other words, as the single segment is turned on and off, the light directed at the display is reflected or not depending on the state of the single segment with the corner cube disposed behind it, akin to modulating light via Morse code. Advantageously, the apparatus of amended claim 1 results in low power consumption, low implementation cost and covert transmission since a separate component is not required to transmit the data but the data is transmitted by a component, i.e., the display, which is also used for other purposes, i.e., display human readable information. As stated on page 25, line 18-page 26 line 7 of the instant application:

The advantages of this passive transmitter for the in-car parking meters are very low power consumption, low implementation cost and covert, at a distance transmission. Since the passive transmitter needs only to modulate a LCD segment, power consumption for the transmission of serial data requires a only a few microwatts of power making it very suitable for in-car parking meters that operate off of a small Lithium battery for several years. The low implementation cost derives from use of the same LCD for both light modulation and display of human readable information. Additionally, since the modulated light is only returned directly back to the receiver and looks to the motorists as just another LCD segment, the passive transmitter provides a very covert communications channel that can work from several feet away. This allows parking enforcement officers to utilize an external receiver to read additional information about the status of the in-car parking meter not displayed on the LCD in human readable form. This information may contain the serial number, time parked, money in the electronic bank, etc; too much information to put on the display in human readable form as well as information that it would be desirable to limit public access to.

In regards to claim 1, the Examiner asserted Huang "fails to explicitly teach an LCD screen: wherein said display means includes a controllable segment configured to allow light to pass through said display means when the controllable segment is off and blocks light when from passing through said display means when the controllable segment is on; and a corner cube disposed behind the controllable segment of said display means configured to reflect light back to its source external of the apparatus when the controllable segment is off, wherein upon light being directed at said display means by teh source external to the apparatus, the controllable segment is turned on and off at a serial data rate by said microcomputer to passively transmit status and parking-related data from said apparatus". The Examiner then asserted "Ferguson discloses that reflective-type LCD screens are old and well known in the art...Moreover, Ferguson also discloses that it is also old and well known to use corner cubes as the reflective material of such a system. ...

As a result, all of the components parts are known in Huang and Fergason. The only difference is the combination of the "old elements" into a single device by mounting them on a single chassis. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the combination of Huang with the teachings of Fergason to include a reflective-type LCD screen for a system that requires some type of transmission through an LCD". Furthermore, the Examiner asserted "that it is old and well known for LCD's to have a refresh rate and that the refresh rate is controlled by a microcomputer. With that said, the Examiner asserts that the combination of Huang and Fergason does, indeed, disclose the transmission of data by modulating on and off the light reflected by the corner cube since it is obviously included that an LCD screen contains a refresh rate which would prevent data from transmitting when it is on (not transparent) and allow data to be transmitted when it is off (transparent) since the refresh rate is a safety measurement taken to prevent burning (imprinting) images on an LCD".

Huang is directed to a microprocessor parking meter internally held in a car. At best, Huang only discloses an LED display having no segments to allow light to pass through and data transmission via a wire 53 to another meter. Huang does not specifically disclose an LCD type of display.

To overcome the deficiencies of Huang, the Examiner provides Fergason to show LCD displays are known. Fergason is directed to a passive dithering display system including an optical display including a plurality of pixels with optical dead space between the pixels for producing an image, and a birefringent material for shifting one polarization component of the image relative to a second polarization component of the image such that the shifted polarization component lies in the dead space. Column 47, lines 3-27 of

Ferguson discloses the use of a retro-reflector 723, also known as a corner reflector, in conjunction with FIG. 47. In FIG. 47, an image source 715 displays an image 825, where the light from the source is directed to a beamsplitter 722 which then directs the light to the retro-reflector 723. The retro-reflector 723 then reflects the light toward the eye 713 of a viewer. The "controllable segment" as asserted by the Examiner is then turned on and off to allow the image reflected by the retro-reflector 723 to be visible to the pupil of the eye 713. Furthermore, the Examiner asserted a refresh rate of an LCD turns on and off the LCD screen to prevent and allow data to be transmitted.

It is respectfully submitted the refresh rate of an LCD screen would turn on and off all segments of a screen to prevent burn-in of an image on the screen. Although the refresh rate may have a predetermined rate for turning on and off the pixels of the screen, the refresh rate in no way is meant to modulating the pixels so light reflected from a mechanism behind the pixels has any meaning. The apparatus for use in a parking system of amended claim 1 now recites "a display means for displaying human readable information including a plurality of segments electrically coupled to and controlled by said microcomputer, said display means externally located on a face of said housing, wherein each segment is configured to allow light to pass through said display means when each segment is off and blocks light from passing through said display means when each segment is on; a corner cube disposed behind a single segment of the plurality of segments of said display means configured to reflect light back to a source external of the apparatus when the single segment is off, wherein upon light being directed at said display means by the source external to the apparatus, the single segment is turned on and off at a serial data rate by said microcomputer to passively transmit non-human readable status

and parking-related data from said apparatus by modulating on and off the light reflected by the corner cube through the single segment" (emphasis added). As opposed to a refresh rate which would turn on and off all segments of a screen to prevent burn-in, the apparatus of amended claim 1 including a plurality of segments which are controlled to display human readable information, where a single segment includes a corner cube disposed behind it to reflect light in a data transmission mode. The single segment is modulated on and off in a controlled manner to reflect the light as serial data not readable by the human eye.

While Ferguson discloses reflective-type LCD screens and corner reflectors in LCD screens, Ferguson does not cure the deficiencies of Huang. Nowhere in Ferguson is it disclosed that the LCD display include "a single segment" and "a corner cube disposed behind a single segment of the plurality of segments of said display means configured to reflect light back to a source external of the apparatus when the single segment is off, wherein upon light being directed at said display means by the source external to the apparatus, the single segment is turned on and off at a serial data rate by said microcomputer to passively transmit non-human readable status and parking-related data from said apparatus by modulating on and off the light reflected by the corner cube through the single segment" as recited in amended claim 1. The combination of Huang and Ferguson does not teach at least the controllable single segment for transmitting serial, non-human readable data and the functionality it imparts to the apparatus of amended claim 1, and therefore, does not teach all the limitations of claim 1. Furthermore, a refresh rate of an LCD screen in no way suggests the configuration of the display means, single segment and corner cube to impart the functionality of the apparatus of amended claim 1.

Therefore, it is respectfully submitted claim 1 is patentably distinct and not rendered obvious by Huang and Fergason, alone or in any combination. It is respectfully submitted that dependent claims 2-14, depending directly or indirectly from amended claim 1, are patentable for at least the reasons stated above in regard to claim 1.

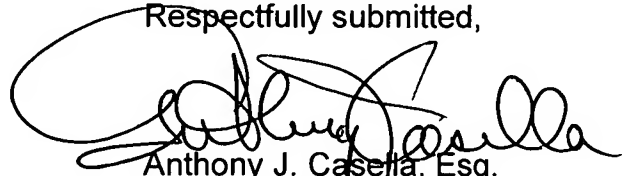
Claim 17 is directed to an electronic parking system including, inter alia, "an in-car parking meter having a first data transferring means and a display for displaying human readable information including a plurality of segments, said meter being disposed in an automobile such that said display can be viewed from a location external to said automobile, said first data transferring means includes a single controllable segment of the plurality of segments configured to allow light to pass through said display when the single controllable segment is off and blocks light from passing through said display when the single controllable segment is on and a reflector disposed behind the single controllable segment of said display configured to reflect light back to a source external of the apparatus when the single controllable segment is off, wherein upon light being directed at said display, the single controllable segment is turned on and off at a serial data rate to passively transmit non-human readable status and parking-related data from said in-car parking meter by modulating on and off the light reflected by the reflector through the single controllable segment, and an external transceiver having a second data transferring means, said second data transferring means configured to communicate with said first transferring means of said in-car parking meter, said second data transferring means including a light point source for directing light at the single controllable segment and a photodetector for receiving said non-human readable status and parking-related data from

said in-car parking meter by detecting the modulated light reflected by the reflector through the single controllable segment." (Emphasis added).

At least for the reasons put forth for amended claim 1, it is respectfully submitted that amended Claim 17, along with dependent claims 19-25 and 29, is patentably distinct and not rendered obvious over Huang, Ferguson and Jacobs alone or in any combination and is believed to be in condition for allowance.

In view of the preceding amendment and remarks, it is submitted that the claims remaining in the application, to wit, claims 1-14, 17-25 and 29, are directed to patentable subject matter, and allowance is solicited. The Examiner is urged to contact applicant's attorney at the number below if the Examiner believes a telephone or personal interview would facilitate the prosecution of this application.

Respectfully submitted,



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